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EXAMINER

PADGETT, MARIANNE L

ART UNIT PAPER NUMBER

1762

DATE MAILED: 10/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/374344

Applicant(s)

Hayakawa et al

Examiner

M.L. Progett

Group Art Unit

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— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- ☒ Responsive to communication(s) filed on 7/3/03, 7/23/03 + 8/1/03
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 301-307, 309-319 + 321-329 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 301-307, 309-319 + 321-329 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some* ☐ None of the:
 - ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 25
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

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1. The terminal disclaimer removes the obviousness double patenting rejection over PN 6,013,372 and the certified translations (7-99425, March 20, 1995, Fig. 6 has contact angle less than 10° for 50% wt TiO₂) removes the references to Nissan, Toyota (Suzuki) and Fukayama et al, as prior art.

The Declaration of Dr. T. Watanabe is considered to show the difference in processes/materials of the Okaniwa et al teachings and the present claims/invention, especially with the reported results on page 36/Table 1 of the specification, i.e. Okaniwa et al's hydrophilicity appears to be not due to photoactivated or photocatalytic effects, but due to deposited chemical compositions, that happens to be photocured (?) to result in hydrophilic exposed areas.

2. Claims 312-319, 321-322 and 327-329 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 312, "environmental precipitation" in lines 9-10 (and to a lesser extent in line 2 of the preamble, where its previous use did not necessarily effect the claim) is vague and indefinite, because what is being precipitated is not defined, or is ambiguous. For example, the phrase could be referring to deposition of dirt from the environment of the air or any other "environment", or it could be cryptic reference to condensation of water or impingement of rain on the substrate surface. Claims intent in the claims is needed, with citation of support from the specification. It is noted the citations on page 3 of the response giving the support "dirt", contain disclosures that might read on either of the above possibilities for the cryptic wording.

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

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A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 301-307, 309-319 and 321-329 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 19-21 and related claims 1-3, 13-17; or claims 1-15, esp. 14-15 of U.S. Patent No. 6,165,256; or US Patent No. 6,090,489, respectively. Although the conflicting claims are not identical, they are not patentably distinct from each other because in (256), while different orders of claiming limitations are present, with the method claims dependent from the product claims, the same structural or material components are present in both sets of claims with the hydrophilicity being photoinduced in either case and be effected in like manner by environmental water to which it is exposed.

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In (489), while the patent claims are broader, in that they do not require any particular contact angle or degree of "hydrophilifying" i.e. hydrophilicity, the broader scope completely encompasses the narrower specified scope of less than (about) 20° or 10° of the present claims. Also, while the patent claims wetting to remove or repel oil (stains), this may included as a subset of types of dirt, so like concepts are claimed with overlapping and varying scope.

5. Claims 301, 303-306, 309-312, 314-318, 321, 323-324, 326 and 329 are rejected under 35 U.S.C. 103(a) as being unpatentable over Field et al as discussed in Section 7 of Paper No. 18 (19), mailed 4/17/02.

Applicant's arguments for the withdraw of Fields et al rejection for the claims as written, is not convincing, because both requirements of photocatalytic and hydrophilic after exposure are met. Applicant's arguments concerning exposure to sunlight are not relevant to any of the independent claims, and claims 311 and 323 which relate to exposure are directed to sunlight or UV, and over a range of 0.001 to 1 mW/cm² not the .1-1mW/cm² discussed by applicant, where there is no time limit as to how long or short that exposure may be. Therefore, Field et al's taught 10-1000 ergs/cm² (i.e. 0.001 to 0.1 mW·sec/cm²) are consistent with claimed parameters for short exposures, which are not excluded by the claims. Previous arguments concerning open air aqueous development remain, noting that while "tenacious by absorbs water" does not give any particular contact angle, and the PTO cannot measure what angle corresponds thereto, this phrasing and the sensitivity of Field et al's deposits (discussed on page 8 of applicant's July 23, 2003 response) would tend to lead one too expect low contact angles as claimed, since the taught "tenaciously absorbed water" necessitates complete wetting of areas to be imaged/developed. The hydrophilic effect is clearly caused by photocatalyst exposure, so cannot be excluded by the arguments that remove Okaniwa et al. Further, as Field et al attracts water or water-bearing materials, which is consistent with applicant's claims, the dyes, pigments (that are water-bearing),

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are considered neither contaminate nor dirt (nor are they oily as what may be removed in applicants' disclosure or was in their demonstration), hence they do not teach against applicant's purpose.

6. Claims 307, 319 and 322 are rejected under 35 U.S.C. 103(a) as being unpatentable over Field et al as applied to claims 301, 303-306, 309-312, 314-318, 321, 323-324, 326 and 329 above, and further in view of Ogawa et al (EPO 590,477) as applied in Section 8 of Paper No. 18(19), mailed 4/17/02.

7. Applicant's arguments' concerning Murasawa et al (823) are not convincing, because use of the photocatalyst for purification and sterilization, including of oily materials, is consistent with and does not exclude applicant's purpose. Murasawa et al teach oxide and metals of materials claimed, and applicant's presented NO reasons why these like compositions would not have like photocatalytic and hydrophilic effects, **however** considering Watanabe's Declaration concerning Okaniwa's process and the newly cited anonymous articles concerning "Preparing Catalyst Using Metal Alkoxides", Murasawa et al's teaching of such methods (column 4, lines 26-58) which employ $T \geq 100^{\circ}\text{C}$ may, but do not necessarily create the crystalline form of photocatalyst that produces hydrophilicity, and the examples 1-4 (columns 6-7) whose temperatures are al between $100^{\circ} - 200^{\circ}\text{C}$ are too low, hence for these reasons, not those argued by applicant, the rejection using Murasawa et al is rescinded.

8. Claims 301, 305-307, 309, 312, 317-319, 324 and 327 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heller et al (5,616,532), as discussed in Section 10 of Paper No. 18(19), mailed 4/17/02.

Applicant's discussion of one embodiment or option taught in Heller et al, i.e. the hydrophobic enhancer, which is separate from the photocatalyst, does not negate other teachings therein which are consistent with the claims, such as the use for self-cleaning surfaces in a stream of fluid such as air or waters ("method of use" column 11, line 50- column 12, line 35+) or Ex. 7 in columns 17-18. Also, it is further noted that Ex. 2, (column 14, line 50- column 15, line 17) which uses claimed TiO_2 in photo-

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catalyst, is indicated to be hydrophilic by discussion of column 16, lines 1-6, which refer back to Ex. 2, so hydrophilicity of materials as claimed is present in Heller et al. The degree of hydrophilicity is not indicated, and cannot be measured by PTO, but UV light exposure at $4\text{mW}/\text{cm}^2$ for time periods up to 3 hours (Table 6) were disclosed.

The material (i.e. from Ex. 2), which is used in the self cleaning process of Ex. 7, with none of the hydrophilic enhancer discussed by applicants and elsewhere in Heller et al, is used in the test of column 7, lines 15-48, with the photocatalyst TiO_2 being about 50% of the dry weight of the coating, and long exposure time used, hence claimed contact angles would have been consistent with the degree of hydrophilic one might expect to be present in or from Heller's procedure. Note the exemplary intensity Ex. 7 is higher than that claimed in 311 and 323, which were therefore not included in this rejection.

9. Applicant's arguments filed July 23, 2003 and discussed above have been fully considered but they are not persuasive.

The declaration concerning commercial success, while of interest, is not considered sufficient to overcome the above rejections, especially where arguments of process/use are not necessarily commensurate in scope with breadth of claims.

10. Other art of interest to the state of the art, but NOT prior art include: Nakamura et al; Komatsu et al; Chopin et al; Seino et al; Nakashima et al; Greenberg et al; Kanamori et al; Tada et al; Tonar et al; Ikenaga et al; Boire et al Yamazaki et al.

11. Any inquiry concerning this communication from the examiner should be directed to M. L. Padgett whose telephone number is (703) 308-2336. The examiner can generally be reached on Monday-Friday from about 8:30 a.m. to 4:30 p.m.; and fax phone numbers are (703) 872-9306 (Official); and (703) 305-6078 (unofficial).

M.L. Padgett/dh 9/11/03
October 2, 2003

MARIANNE PADGETT
PRIMARY EXAMINER